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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/869,578	10/23/2001	Edmund M. Carnahan	22,852	4596

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EXAMINER

LEE, RIP A

ART UNIT

PAPER NUMBER

1713

DATE MAILED: 09/04/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Applicati n No.

09/869,578

Applicant(s)

CARNAHAN ET AL.

Examiner

Rip A. Lee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This office action follows a response filed on June 23, 2003. Claims 1, 5-9, and 18-20 were amended to correct matters of form.

#### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-13 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/45337 to Peil *et al.* for the same reasons set forth in the previous office action (see Paper No. 6).

Peil *et al.* teaches a process for making a supported catalyst. The inventors prescribe a step in which the support is calcined at 30-1000 °C (p. 40, line 9) such that hydroxyl content is less than 0.8 mmole, and preferably less than 0.5 mmole, per gram of support (page 40, lines 14-15). The support may be treated with a chemical treating agent such as alkylating agents, and

trialkylaluminum compounds (p. 10-13) and silanes (p. 40, lines 22-29). In the Examples, a solution of metal complex is added to slurried silica followed by addition of a solution of co-catalyst. Afterward, solvent is removed under reduced pressure to give a free flowing powder.

The prior art is silent with respect to the relationship between solution volume and support pore volume. It is noted that the surface area, average particle size and pore volume ( $0.1\text{--}3\text{ cm}^3/\text{g}$ ) of silica used in the prior art is essentially the same as that described in the present invention (p. 39, line 30 – p. 40, line 4). Given that the catalyst loadings are similar (see Examples), a reasonable basis exists to believe that the prior art process comprises the claimed addition of complex or co-catalyst such that 100 % of the pore volume of support is not exceeded. Since the PTO does not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Peil *et al.* clearly teaches the use of compounds such as  $(\text{C}_5\text{Me}_4\text{SiMe}_2\text{NCMe}_3)\text{Ti}(\eta^4\text{-C}_5\text{H}_8)$  (see examples and p. 24-27) as well as co-catalysts such as ionic compounds of type  $[\text{L}^*\text{-H}]^+[\text{A}^{d-}]$  (p. 29), ionic tetraborates  $[\text{L}^*\text{-H}]^+[\text{BQ}_4]^-$  (p. 30), cationic oxidizing agents  $(\text{ox}^{e+})_d(\text{A}^{d-})_e$  (p. 32), and carbenium ion compounds  $\text{C}^+\text{A}^-$  (p. 32). The skilled artisan would find it obvious to use any of these compounds since they are adequately disclosed in the prior art.

Peil *et al.* also teaches a process of polymerizing olefins using the catalysts described therein. For instance, the catalyst is introduced into a gas phase reactor charged with ethylene at 240 psi. Polymer is recovered upon completion of the polymerization reaction (see Examples). One skilled in the art would find it obvious to perform the same sequence of steps since this is clearly outlined in the reference.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peil *et al.* in view of U.S. Patent No. 6,025,448 to Swindoll *et al.*

Peil *et al.* does not teach use of silylium compounds as co-catalysts, but Swindoll *et al.* shows that compounds of type  $R_3Si(X')_q^+A^-$  (col. 19, lines 6-20) are well suited as co-catalysts for compounds such as  $(C_5Me_4SiMe_2NCMe_3)Ti(\eta^4-C_5H_8)$ . Thus, one having skill in the art would find it obvious to use silylium cations with the compounds in Peil *et al.*, and one would expect such a combination to work. The combination is obvious because both inventions relate to supported catalysts containing the same type of metallocene complexes.

5. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Peil *et al.* in view of U.S. Patent No. 5,227,440 Canich *et al.*

Peil *et al.* does not teach addition of additional trialkylaluminum as recited in claim 20, but such a step for scavenging adventitious moisture and impurities is well established in the art. In fact, Canich *et al.* teaches this step (col. 19, lines 53-61). Therefore, such a notion would be obvious to one having skill in the art, and one would expect such an embodiment to work. The combination is obvious because both references relate to supported catalysts containing the same type of metallocene compounds.

***Response to Arguments***

6. The Applicants traverse the rejection of claims 1-3, 5-9, 15, 17-20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,227,440 to Canich *et al.* As indicated by Applicants, the prior art shows that metallocene and coactivator (MAO) are combined prior to application onto the support. In contrast, the present claims require the two components to be applied sequentially, and the activator must be non-polymeric/non-oligomeric. As such, the prior art does not teach the subject matter of the present claims. Therefore, the rejection has been withdrawn.

7. The Applicants traverse the rejection of claims 1-20 under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,025,448 to Swindoll *et al.* in view of Canich *et al.* The prior art shows that metallocene and coactivator are combined prior to application onto the support. As such, the prior art does not teach the subject matter of the present claims. Therefore, the rejection has been withdrawn.

8. The Applicants traverse the rejection of claims 1-13 and 15-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 98/45337 to Peil *et al.* Applicant's arguments have been considered fully, but they are not persuasive.

The Applicants have indicated that the slurring process of Peil *et al.* involves amounts of liquid in excess of the pore volume of the support. The Applicants submit that Peil *et al.* prescribes an amount of 5-1000 mL of hydrocarbon diluent per gram of support.

Turning to the examples, one observes that Davison type 948 silica is calcined at 200 °C and treated with triethylaluminum (Example 1). To 0.4 g of treated silica is added about 200 µL

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of toluene, followed by 160  $\mu$ L of a solution of metallocene. The resulting material is treated further with a 180  $\mu$ L aliquot solution containing borane activator. Finally, solvent was removed to give a free flowing powder (Example 18). The process uses about 1.3 mL diluent/g of support, and this is similar to Applicants loading of 1.25 mL diluent/ g support.

In light of the fact that the catalyst loadings are similar, the examiner has a reasonable basis exists to believe that the prior art process comprises the claimed addition of complex or co-catalyst such that 100 % of the pore volume of support is not exceeded. As such, the burden is shifted to the Applicants to establish an unobviousness difference. To date, there is no showing of an unobviousness difference.

The Applicants also submit that removal of solvent after the addition of the first solution is a necessary step in the claimed process. A comparison of Example 2 and Comparative Example 3 may show the criticality of this particular step. Apparently, it is the removal of solvent after adding component (C)(1) to treated silica that results in a difference in polymerization behavior. However, present claim 1 states that this step is optional. There appears to be some inconsistency between what is claimed and what is illustrated in the experimental results. Nonetheless, since the first drying step is optional, it is not required, and thus, the process described in Peil *et al.* meets the requirements set forth in the present claims.

In view of the discussion above, the rejection has not been withdrawn.

Accordingly, the rejections of claims 14 and 20 under 35 U.S.C. 103(a) as being unpatentable over Peil *et al.* in view of Swindoll *et al.* and Canich *et al.*, respectively, remain in force.

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*Conclusion*

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (703)306-0094. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (703)308-2450. The fax phone number for the organization where this application or proceeding is assigned is (703)746-7064. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

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August 29, 2003



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